Imaging Guide

4800dr

Document Reader

powered by Adaptus 5.0

HandHeld PRODUCTS

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- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

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This Class A digital apparatus complies with Canadian ICES-003.

Conformité à la règlementation canadienne

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CE The CE mark on the product indicates that the system has been tested to and conforms with the provisions noted within the 2004/108/EC Electromagnetic Compatibility Directive and the 2006/95/EC Low Voltage Directive.

For further information please contact:

Hand Held Products
Nijverheidsweg 9-13
5627 BT Eindhoven
The Netherlands

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Patents

Please refer to the product packaging for a list of patents.

LED Safety Statement

This device has been tested in accordance with IEC60825-1 LED safety, and has been certified to be under the limits of a Class 1 LED device.

Laser Eye Safety Statement

This product is under the limits of a class 2 laser device.

This device has been tested in accordance with and complies with IEC60825-1: 1993+A1+A2 and 21 CFR 1040.10 and 1040.11, except for deviations pursuant to Laser Notice No. 50, dated July 26, 2001.

LASER LIGHT, DO NOT STARE INTO BEAM, CLASS 2 LASER PRODUCT, 1.0 mW MAX OUTPUT: 650nM.

Caution: Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

UL and cUL Statement

UL and cUL listed: UL60950-1 and CSA C22.2 No.60950-1-03.

C-Tick Statement

Conforms to AS/NZS 3548. C-Tick number: N10410.

Solids and Water Protection

The 4800dr has a rating of IP40, immunity of foreign particles and dripping water.

GS Mark

This product has been issued a GS certificate.

Waste Electrical and Electronic Equipment Information

Note: Hand Held Products complies with Directive 2002/96/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 27 January 2003 on waste electrical and electronic equipment (WEEE).

This product has required the extraction and use of natural resources for its production. It may contain hazardous substances that could impact health and the environment, if not properly disposed.

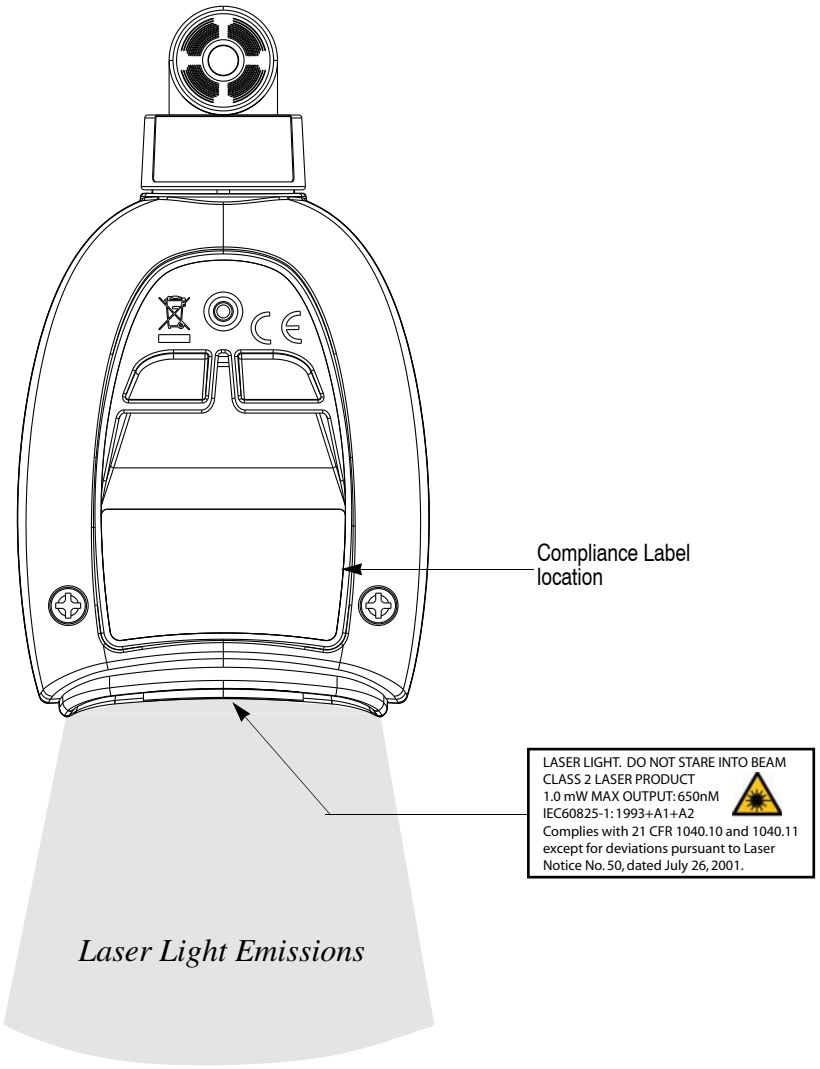
In order to avoid the dissemination of those substances in our environment and to diminish the pressure on the natural resources, we encourage you to use the appropriate take-back systems for product disposal. Those systems will reuse or recycle most of the materials of the product you are disposing in a sound way.

The crossed out wheeled bin symbol informs you that the product should not be disposed of along with municipal waste and invites you to use the appropriate separate take-back systems for product disposal.

If you need more information on the collection, reuse, and recycling systems, please contact your local or regional waste administration.

You may also contact your supplier for more information on the environmental performances of this product.

Document Reader Identification


Compliance Label
location
LASER LIGHT. DO NOT STARE INTO BEAM
CLASS 2 LASER PRODUCT
1.0 mW MAX OUTPUT: 650nM
IEC60825-1: 1993+A1+A2
Complies with 21 CFR 1040.10 and 1040.11
except for deviations pursuant to Laser
Notice No. 50, dated July 26, 2001.
Laser Light Emissions

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1 Imaging Commands

The document reader is like a digital camera in the way it captures, manipulates, and transfers images. The following commands allow you to alter the way the document reader performs these functions.

Single-Use Basis

Imaging Commands with their modifiers send instructions to the document reader on a single-use basis, and take effect for a single image capture. Once that capture is complete, the document reader reverts to its imaging default settings. If you want to permanently change a setting, you must use the serial default commands (see Chapter 2). When the serial default command is used, that selection becomes the new, permanent setting for the document reader.

Command Syntax

Multiple modifiers and commands can be issued within one sequence. If additional modifiers are to be applied to the same command, just add the modifiers to that command. For example, to add 2 modifiers to the Image Snap command, such as setting the Imaging Style to 1P and the Wait for Trigger to 1T, you would enter **IMGSNP1P1T.**

Note: After processing an image capture command (IMGSNP or IMGBOX), you must follow it with an IMGSHP or IMGACP command if you want to see it on your terminal.

To add a command to a sequence, each new command is separated with a semicolon. For example, to add the Image Ship command to the above sequence, you would enter **IMGSNP1P1T;IMGSHP.**

The imaging commands are:

Image Snap - IMGSNP (page 1-1)

Image Ship - IMGSHP (page 1-5)

Intelligent Signature Capture - IMGBOX (page 1-14)

The modifiers for each of these commands follow the command description.

Step 1 - Take a Picture Using IMGSNP

Image Snap - IMGSNP

An image is taken whenever the hardware button is pressed, or when the Image Snap (IMGSNP) command is processed.

The image snap command has many different modifiers that can be used to change the look of the image in memory. Modifiers always begin with numbers and end with a letter (case insensitive). Any number of modifiers may be appended to the IMGSNP command. For example, you can use the following command to snap an image, increase the gain, and have the beeper sound once the snap is complete:

IMGSNP2G1B

IMGSNP Modifiers

P - Imaging Style

This sets the Image Snap style.

- 0P **Decoding Style**. This processing allows a few frames to be taken until the exposure parameters are met. The last frame is then available for further use.
- 1P **Photo Style *(default)***. This mimics a simple digital camera, and results in a visually optimized image.
- 2P **Manual Style**. This is an advanced style that should only be used by an experienced user. It allows you the most freedom to set up the document reader, and has no auto-exposure.

B - Beeper

Causes a beep to sound after an image is snapped.

- 0B No beep *(default)*
- 1B Sounds a beep when the image is captured.

T - Wait for Trigger

Waits for a hardware button push before taking the image. This is only available when using Photo Style (1P).

0T Takes image immediately *(default)*

1T Waits for a button push, then takes the image

L - LED State

Determines if the LEDs should be on or off, and when. Ambient illumination (0L) is preferred for taking pictures of color documents, such as ID cards, especially when the document reader is in a stand. LED illumination (1L) is preferred when the document reader is hand held. LED State is not available when using Decoding Style (0P).

0L LEDs off *(default)*

1L LEDs on

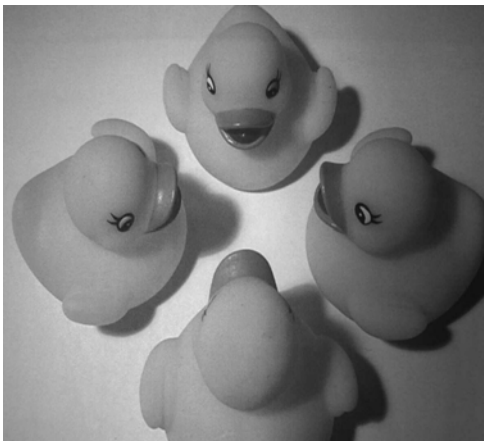
A - Aimer Lines

Sets whether the aimer lines will be captured with the image or not. In order to capture the aimer lines, the LEDs must also be off. If the LEDs are on, the aimer lines will not be captured.

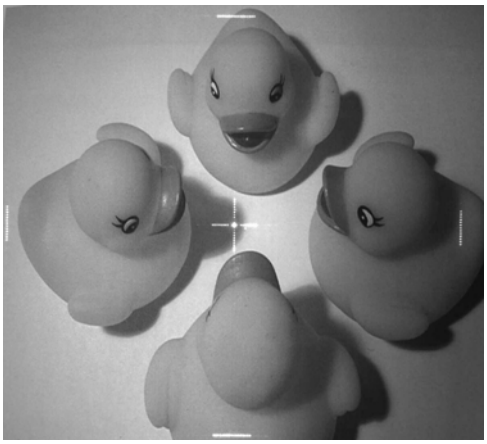
0A Aimer Lines off *(default)*

1A Aimer Lines on

Example of Aimer Lines Off (0A):



Example of Aimer Lines On (1A) with LEDs off (0L):

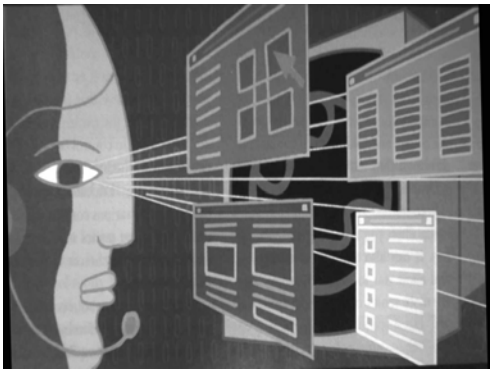


E - Exposure

Exposure is used in Manual Style only (2P), and allows you to set the exposure time. This is similar to setting a shutter speed on a camera. The exposure time determines how long the imager takes to record an image. On a bright day, exposure times can be very short because plenty of light is available to help record an image. At nighttime, exposure time can increase dramatically due to the near absence of light. Units are 127 microseconds. *(Default = 7874)*

*n*E Range: 1 - 7874

Example of Exposure at 7874E with fluorescent lighting:



Example of Exposure at 100E with fluorescent lighting:

G - Gain

Gain is used in Manual Style only (2P). Like a volume control, the gain modifier boosts the signal and multiplies the pixel value. As you increase the gain, the noise in an image is also amplified.

1G No gain *(default)*

2G Medium gain

4G Heavy gain

8G Maximum gain

Example of Gain at 1G:

Example of Gain at 4G:

Example of Gain at 8G:

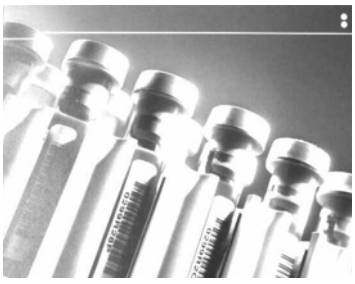
W - Target White Value

Sets the target for the median grayscale value in the captured image. For capturing close-up images of high contrast documents, a lower setting, such as 75, is recommended. Higher settings result in longer exposure times and brighter images, but if the setting is too high, the image may be overexposed. Target White Value is only available when using Photo Style (1P). *(Default = 125)*

*n*W Range: 0 - 255

Example of White Value at 75W:

Example of White Value at 125W:



Example of White Value at 200W:

D - Delta for Acceptance

This sets the allowable range for the white value setting (see W - Target White Value). Delta is only available when using Photo Style (1P). *(Default = 25)*

*n*D Range: 0 - 255

U - Update Tries

This sets the maximum number of frames the document reader should take to reach the D - Delta for Acceptance. Update Tries is only available when using Photo Style (1P). *(Default = 6)*

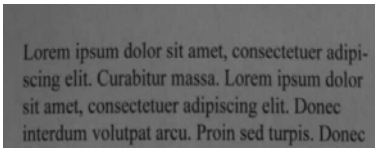
*n*U Range: 0 - 10

% - Target Set Point Percentage

Sets the target point for the light and dark values in the captured image. A setting of 75% means 75% of the pixels are at or below the target white value, and 25% of the pixels are above the target white value. Altering this setting from the default is not recommended under normal circumstances. To alter grayscale values, W - Target White Value should be used. *(Default = 97)*

n% Range: 1 - 99

Example of Target Set Point Percentage at 97%: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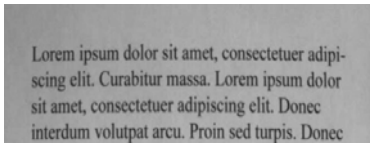
Example of Target Set Point Percentage at 50%: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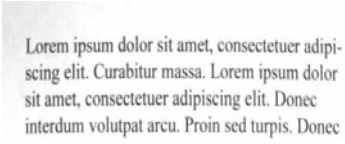
Example of Target Set Point Percentage at 40%: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Step 2 - Ship a Picture Using IMGSHP or IMGACP

Image Ship - IMGSHP

An image is taken whenever the button is pressed, or when the Image Snap (IMGSNP) command is processed. The last image is always stored in memory. You can “ship” the image by using the IMGSHP or IMGACP command.

The image ship and image auto crop commands have many different modifiers that can be used to change the look of the image output by the document reader. Modifiers affect the image that is transmitted, but do not affect the image in memory. Modifiers always begin with a number and end with a letter (case insensitive). Any number of modifiers may be appended to the IMGSHP or IMGACP command. For example, you can use the following command to snap and ship a bitmap image with gamma correction and document image filtering:

IMGSNP;IMGSHP8F75K26U

Image Auto Crop - IMGACP

Image Auto Crop removes unwanted portions of an image, such as blank space surrounding an image. Image Auto Crop uses artificial intelligence to search for the area of the image that contains text. It then crops the image to just that area and adjusts it to a horizontal display. Depending on the size and position of the document, this may possibly result in an upside-down or sideways image. The image can then be rotated to the proper orientation using your local software. Smaller documents will crop more quickly than larger documents. The accuracy of auto crop is affected by the density of the text, amount of non-text features, and contrast in the image.

Note: Any modifiers to IMGACP are applied to the resultant, auto cropped image.

The same modifiers are used for image ship and image auto crop. The following command was used to take and crop an image that had the white value lowered and the edge sharpen filter on:

IMGSNP75W;IMGACP14E

Image taken without Autocrop:

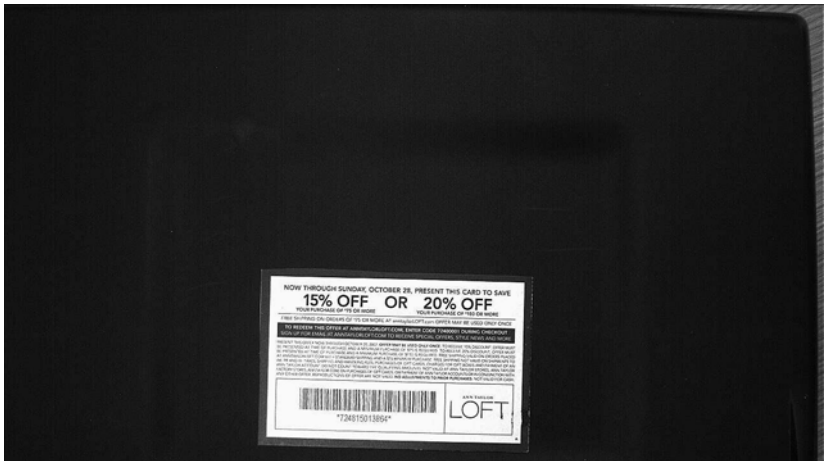


Image taken with Autocrop:

IMGSHP/IMGACP Modifiers

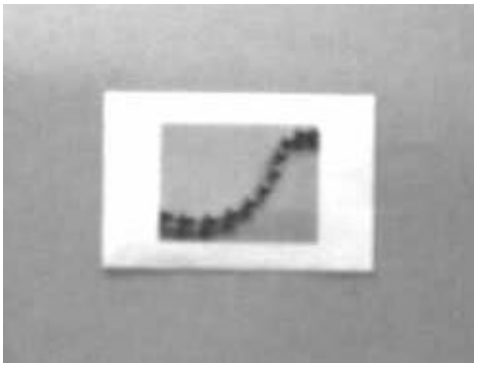
A - Infinity Filter

Enhances pictures taken from very long distances (greater than 10 feet or 3m). The Infinity Filter should not be used with Image Auto Crop - IMGACP (page 1-5).

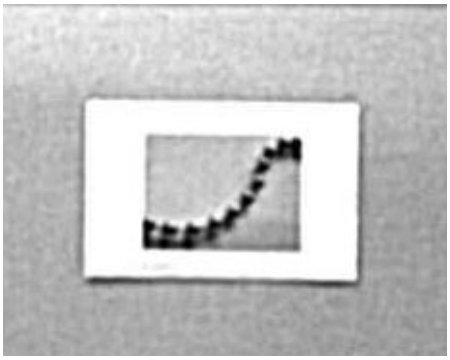
0A Infinity filter off *(default)*

1A Infinity filter on

Example of Infinity Filter off (0A) from approximately 12 feet (3.66m) away:



Example of Infinity Filter on (1A) from approximately 12 feet (3.66m) away:



C - Compensation

Flattens the image to account for variations in illumination across the image.

0C Compensation disabled *(default)*

1C Compensation enabled

Example of Compensation at 0C:

Example of Compensation at 1C:

D - Pixel Depth

Indicates the number of bits per pixel in the transmitted image (KIM or BMP format only).

8D 8 bits per pixel, grayscale image *(default)*

1D 1 bit per pixel, black and white image

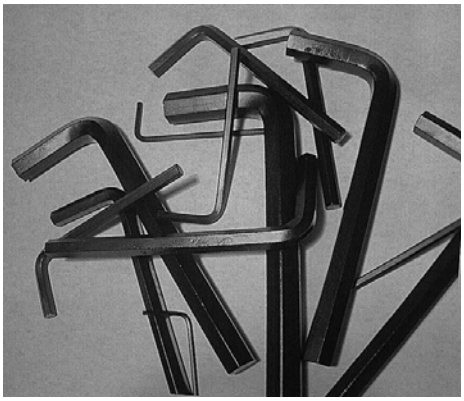
E - Edge Sharpen

An edge sharpen filter cleans up the edges of an image, making it look cleaner and sharper. While edge sharpening does make the image look cleaner, it also removes some fine detail from the original image. The strength of the edge sharpen filter can be entered from 1 to 24. Entering a 23E gives the sharpest edges, but also increases noise in the image.

- 0E Don't sharpen image *(default)*
- 14E Apply edge sharpen for typical image
- *n*e Apply edge sharpen using strength *n* (*n* = 1-24)

Example of Edge Sharpen at 0E:

Example of Edge Sharpen at 24E:



F - File Format

Indicates the desired format for the image.

- 0F KIM format
- 1F TIFF binary
- 2F TIFF binary group 4, compressed
- 3F TIFF grayscale
- 4F Uncompressed binary (upper left to lower right, 1 pixel/bit, 0 padded end of line)
- 5F Uncompressed grayscale (upper left to lower right, bitmap format)
- 6F JPEG image *(default)*
- 8F BMP format (lower right to upper left, uncompressed)

H - Histogram Stretch

Increases the contrast of the transmitted image. Not available with some image formats.

- 0H No stretch *(default)*
- 1H Histogram stretch

Example of Histogram Stretch at 0H:

Example of Histogram Stretch at 1H:

I - Invert Image

Invert image is used to rotate the image around the X or Y axis.

Note: This feature should only be used with Image Ship - IMGSHP (page 1-5). Using this feature with Image Auto Crop - IMGACP (page 1-5) may produce undesired results since Image Auto Crop attempts to rotate an image to a horizontal display.

1ix Invert around the X axis (flips picture upside down)

1iy Invert around the Y axis (flips picture left to right)

Example of image not inverted:

Example of image with Invert Image set to 1ix:

Example of image with Invert Image set to 1iy:

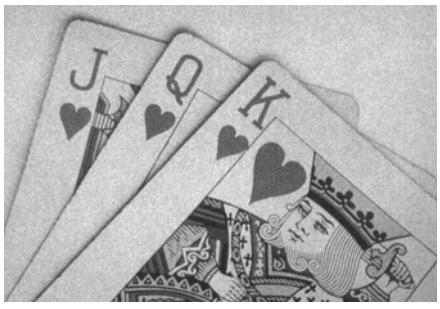
IF- Noise Reduction

Used to reduce the salt and pepper noise in an image.

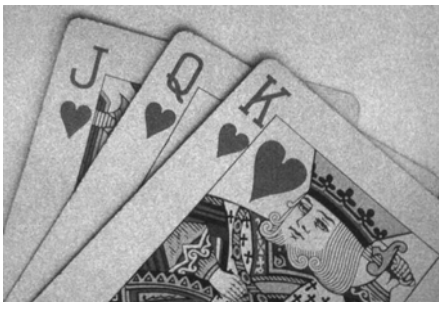
0if No salt and pepper noise reduction (default)

1if Salt and pepper noise reduction

Example of Noise Reduction Off (0if):



Example of Noise Reduction On (1if):



IR - Image Rotate

Note: This feature should only be used with Image Ship - IMGSHP (page 1-5). Using this feature with Image Auto Crop - IMGACP (page 1-5) may produce undesired results since Image Auto Crop attempts to rotate an image to a horizontal display.

- 0ir Image as snapped (rightside up) (default)
- 1ir Rotate image 90 degrees to the right
- 2ir Rotate image 180 degrees (upside down)
- 3ir Rotate image 90 degrees to the left

Example of Image Rotate set to 0ir:

Example of Image Rotate set to 2ir:

Example of Image Rotate set to 1ir:

Example of Image Rotate set to 3ir:

IU - Image Adaptive Text Filter

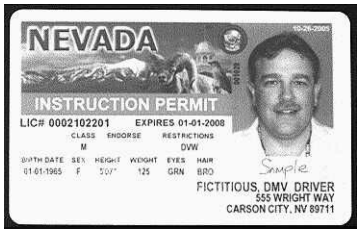
The Adaptive Text Filter automatically sharpens the edges and smooths the area between the edges of text in an image. The Adaptive Text Filter enhances images of documents such as ID cards and prescriptions, resulting in crisper text.

See U - Document Image Filter (page 1-12) for information about setting the Document Image Filter manually.

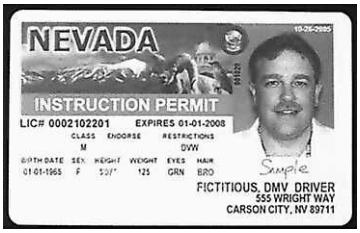
Note: The Adaptive Text Filter should not be used concurrently with the IS - Unsharp/Brighten Filter.

- 0iu Adaptive Text Filter off (default)
- 1iu Adaptive Text Filter on

Example of Adaptive Text Filter Off (0iu):



Example of Adaptive Text Filter On (1iu):



IS - Unsharp/Brighten Filter

The Unsharp/Brighten Filter automatically sharpens the text and brightens the contrast of the image, making text more readable. This is similar to the Image Adaptive Text Filter, however it brightens the image as well. You should test both image processing techniques to determine which filter works best for your environment.

Note: The Unsharp/Brighten Filter should not be used concurrently with the IU - Image Adaptive Text Filter.

- 0is Unsharp/Brighten Filter off (default)
- 1is Unsharp/Brighten Filter on

Example of Unsharp/Brighten Filter Off (0is):

Example of Unsharp/Brighten Filter On (1is):

J - JPEG Image Quality

Sets the desired quality when the JPEG image format is selected. Higher numbers result in higher quality, but larger files. Smaller numbers result in greater amounts of lossy compression, faster transmission times, lower quality, but smaller files. *(Default = 50)*

- *n*J Image is compressed as much as possible while preserving quality factor of *n* (*n* = 0 - 100)
- 0J worst quality (smallest file)
- 100J best quality (largest file)

K - Gamma Correction

Gamma measures the brightness of midtone values produced by the image. You can brighten or darken an image using gamma correction. A higher gamma correction yields an overall brighter image. The lower the setting, the darker the image. The optimal setting for text images is 50K.

- 0K Gamma correction off *(default)*
- 50K Apply gamma correction for brightening typical document image
- *n*K Apply gamma correction factor *n* (*n* = 0-1,000)

Example of Gamma Correction set to 0K:

Example of Gamma Correction set to 50K:

Example of Gamma Correction set to 255K:

L, R, T, B, M - Image Cropping

Note: Image Cropping should not be used with Image Auto Crop - IMGACP (see page 1-5).

Ships a window of the image by specifying the left, right, top, and bottom pixel coordinates. Device columns are numbered 0 through 1279, and device rows are numbered 0 through 959.

*n*L The left edge of the shipped image corresponds to column *n* of the image in memory. Range: 000 - 1279. *(Default = 0)*

*n*R The right edge of the shipped image corresponds to column *n* - 1 of the image in memory. Range: 000 - 1279. *(Default = all columns)*

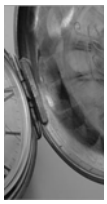
*n*T The top edge of the shipped image corresponds to row *n* of the image in memory. Range: 000 - 959. *(Default = 0)*

*n*B The bottom edge of the shipped image corresponds to row *n* - 1 of the image in memory. Range: 000 - 959. *(Default = all rows)*

Uncropped Image:

Example of Image Crop set to 300R:

Example of Image Crop set to 300L:



Example of Image Crop set to 200B:

Example of Image Crop set to 200T:

Alternately, specify the number of pixels to cut from the outside margin of the image; thus only the center pixels are transmitted.

*n*M Margin: cut *n* columns from the left, *n* + 1 columns from the right, *n* rows from the top, and *n* + 1 rows from the bottom of the image. Ship the remaining center pixels. Range: 0 - 478. *(Default = 0, or full image)*

Example of Image Crop set to 238M:

P - Protocol

Used for shipping an image. Protocol covers two features of the image data being sent to the host. It addresses the protocol used to send the data (Hmodem, which is an Xmodem 1K variant that has additional header information), and the format of the image data that is sent.

0P None (raw data)

2P None *(default for USB)*

3P Hmodem compressed *(default for RS-232)*

4P Hmodem

S - Pixel Ship

Pixel Ship sizes an image in proportion to its original size. It decimates the image by shipping only certain, regularly spaced pixels. For example, **4S** would transmit every fourth pixel from every fourth line. The smaller number of pixels shipped, the smaller the image, however, after a certain point the image becomes unusable.

1S ship every pixel *(default)*

2S ship every 2nd pixel, both horizontally and vertically

3S ship every 3rd pixel, both horizontally and vertically

Example of Pixel Ship set to 1S:

Example of Pixel Ship set to 2S:

Example of Pixel Ship set to 3S:

Example of Pixel Ship set to 4S:

U - Document Image Filter

Allows you to input parameters to sharpen the edges and smooth the area between the edges of text in an image. This filter should be used with gamma correction (see page 1-10), with the document reader in a stand, and the image captured using the command:

IMGSNP1P0L168W90%32D

This filter typically provides better JPEG compression than the standard E - Edge Sharpen command (see page 1-13). This filter also works well when shipping pure black and white images (1 bit per pixel). The optimal setting is 26U.

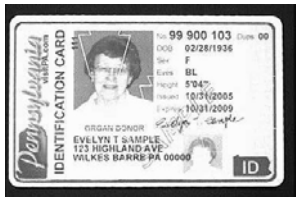
Note: If you want to use an automatic image filter, rather than changing these settings manually, refer to IU - Image Adaptive Text Filter (page 1-9).

0U Document image filter off *(default)*

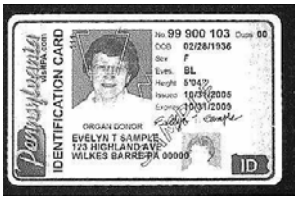
26U Apply document image filter for typical document image

*n*U Apply document image filter using grayscale threshold n. Use lower numbers when the image contrast is lower. 1U will have a similar effect to setting E - Edge Sharpen (page 1-7) to 22e. Range: 0-255.

Example of Document Image Filter set to 0U:



Example of Document Image Filter set to 26U:



V - Blur Image

Smooths transitions by averaging the pixels next to the hard edges of defined lines and shaded areas in an image.

0V Don't blur *(default)*

1V Blur

Example of Blur Image Off (0V):

Example of Blur Image On (1V):

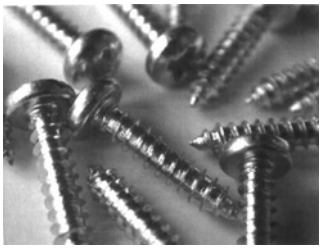
W - Histogram Ship

A histogram gives a quick picture of the tonal range of an image, or key type. A low-key image has detail concentrated in the shadows; a high-key image has detail concentrated in the highlights; and an average-key image has detail concentrated in the midtones. This modifier ships the histogram for an image.

0W Don't ship histogram *(default)*

1W Ship histogram

Image used for histogram:



Histogram of image at left:

Intelligent Signature Capture - IMGBOX

IMGBOX allows you to configure the size and location of a signature capture area relative to its proximity to a barcode. This allows you to tailor a signature capture area to a specific form. In order to use IMGBOX, you need a set form where the signature box location is in a known location relative to a barcode. You can input the overall size of the signature area, as well as specify how far the signature area is from the barcode, vertically and horizontally. You can also set the resolution and file format for the final output of the signature capture image.

Note: IMGBOX commands can only be triggered by one of the following types of barcodes: PDF417, Code 39, Code 128, Aztec, Codabar, and Interleaved 2 of 5. Once one of these symbologies has been read, the image is retained for a possible IMGBOX command.

The following IMGBOX example was executed and viewed using QuickView software. This software is available at www.handheld.com. Click on **Services and Support**-**Download Software**. Select **4800dr** from the Products list, then select **QuickView Software Utility**.

Below is an example of a signature capture application. In this example, the aimer is centered over the signature capture area and the trigger is pressed. A single beep is emitted, indicating that the imager has read a Code 128 barcode and the data has been transferred to the host. An IMGBOX command may now be sent from the host to specify the coordinates of the signature capture area below that code, and indicating that only that area containing the signature should be transferred as an image to the host.

To see this example, align the aimer with the signature area (not with the barcode), then press the trigger.

Send the following IMGBOX command string after the button push:

IMGBOX245w37h55y.

Note: Case is not important in the command string. It is used here only for clarity.

The following image is captured:

The IMGBOX commands have many different modifiers that can be used to change the size and appearance of the signature image output by the document reader. Modifiers affect the image that is transmitted, but do not affect the image in memory. Modifiers always begin with a number and end with a letter (case insensitive). Any number of modifiers may be appended to the IMGBOX command.

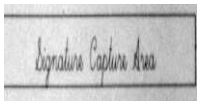
Note: The IMGBOX command will return a NAK unless a window size (width and height) are specified. See H - Height of Signature Capture Area (page 1-15) and W - Width of Signature Capture Area (page 1-16).

IMGBOX Modifiers

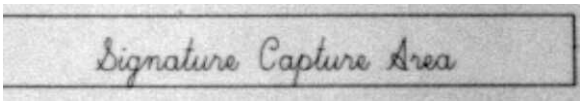
A - Output Image Width

This option is used to size the image horizontally. If using this option, set the resolution (R) to zero.

Example of Image Width set to 200A:



Example of Image Width set to 600A:

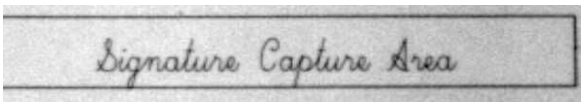


B - Output Image Height

This option is used to size the image vertically. If using this option, set the resolution (R) to zero.

Example of Image Height set to 50B:

Example of Image Height set to 100B:



D - Pixel Depth

This indicates the number of bits per pixel in the transmitted image, which defines whether it will be grayscale or black and white.

- 8D 8 bits per pixel, grayscale image *(default)*
- 1D 1 bit per pixel, black and white image

F - File Format

This option indicates the type of file format in which to save the image.

- 0F KIM format
- 1F TIFF binary
- 2F TIFF binary group 4, compressed
- 3F TIFF grayscale
- 4F Uncompressed Binary
- 5F Uncompressed grayscale
- 6F JPEG image *(default)*
- 7F Outlined image
- 8F BMP format

H - Height of Signature Capture Area

The height of the signature capture area must be measured in inches divided by .01. In the example, the height of the area to be captured is 3/8 inch, resulting in a value of H = .375/0.01 = 37.5.

Example: IMGBOX245w**37h**55y.

K - Gamma Correction

Gamma measures the brightness of midtone values produced by the image. You can brighten or darken an image using gamma correction. A higher gamma correction yields an overall brighter image. The lower the setting, the darker the image. The optimal setting for text images is 50K.

- 0K Gamma correction off *(default)*
- 50K Apply gamma correction for brightening typical document image
- *n*K Apply gamma correction factor *n* (*n* = 1-255)

Example of Gamma Correction set to 0K:

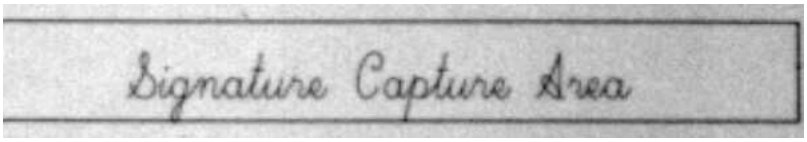
Example of Gamma Correction set to 50K:

Example of Gamma Correction set to 255K:

R - Resolution of Signature Capture Area

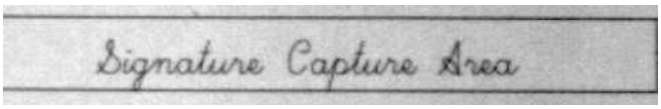
The resolution is the number of pixels that the document reader outputs per each minimum bar width. The higher the value for R, the higher the quality of the image, but also the larger the file size. Values begin at 1000. The document reader automatically inserts a decimal point between the first and second digit. For example, use 2500 to specify a resolution of 2.5. Set to zero when using the A and B modifiers (see A - Output Image Width and B - Output Image Height on page 1-15).

Example of Resolution set to 0R:



Example of Resolution set to 1000R:

Example of Resolution set to 2000R:



S - Barcode Aspect Ratio

All dimensions used in IMGBOX are measured as multiples of the minimum element size of the barcode. The barcode aspect ratio allows you to set the ratio of the barcode height to the narrow element width. In the example, the narrow element width is .010 inches and the barcode height is 0.400 inches, resulting in a value of S = 0.4/0.01 = 40.

W - Width of Signature Capture Area

The width of the signature capture area must be measured in inches divided by .01. In the example, the width of the area to be captured is 2.4 inches, resulting in a value of W = 2.4/0.01 = 240. (A value of 245 was used in the example to accommodate a slightly wider image area.)

Example: IMGBOX**245w**37h55y.

X - Horizontal Barcode Offset

The horizontal barcode offset allows you to offset the horizontal center of the signature capture area. Positive values move the horizontal center to the right and negative values to the left. Measurements are in multiples of the minimum bar width.

Example of Horizontal Offset set to 75X:

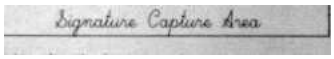
Example of Horizontal Offset set to -75X:

Y - Vertical Barcode Offset

The vertical barcode offset allows you to offset the vertical center of the signature capture area. Negative numbers indicate that the signature capture is above the barcode, and positive numbers indicate that the area is below the barcode. Measurements are in multiples of the minimum bar width.

Example of Vertical Offset set to -7Y:

Example of Vertical Offset set to 65Y:



2 Serial Default Commands

The following serial default commands are used to program the imaging features for your document reader. For complete descriptions of each command, refer to the corresponding page in this manual. For non-imaging programming commands, refer to the Barcode Manual.

The following commands can be sent via a PC COM port using terminal emulation software.

Conventions

The following conventions are used for menu and query command descriptions:

parameter A label representing the actual value you should send as part of a command.

[*option*] An optional part of a command.

{Data} Alternatives in a command.

bold Names of menus, menu commands, buttons, dialog boxes, and windows that appear on the screen.

Menu Command Syntax

Menu commands have the following syntax (spaces have been used for clarity only):

Prefix Tag SubTag {Data} [, SubTag {Data}] [; Tag SubTag {Data}] […] Storage

Prefix	Three ASCII characters: **SYN M CR** (ASCII 22,77,13).
Tag	A 3 character case-insensitive field that identifies the desired menu command group. For example, all RS-232 configuration settings are identified with a Tag of **232**.
SubTag	A 3 character case-insensitive field that identifies the desired menu command within the tag group. For example, the SubTag for the RS-232 baud rate is **BAD**.
Data	The new value for a menu setting, identified by the Tag and SubTag.
Storage	A single character that specifies the storage table to which the command is applied. An exclamation point (**!**) performs the command's operation on the device's volatile menu configuration table. A period (**.**) performs the command's operation on the device's non-volatile menu configuration table. Use the non-volatile table only for semi-permanent changes you want saved through a power cycle.

Query Commands

Several special characters can be used to query the device about its settings.

- **^** What is the default value for the setting(s).
- **?** What is the device's current value for the setting(s).
- ***** What is the range of possible values for the setting(s). (The device's response uses a dash (**-**) to indicate a continuous range of values. A pipe (**|**) separates items in a list of non-continuous values.)

Tag Field Usage

When a query is used in place of a Tag field, the query applies to the *entire* set of commands available for the particular storage table indicated by the Storage field of the command. In this case, the SubTag and Data fields should not be used because they are ignored by the device.

SubTag Field Usage

When a query is used in place of a SubTag field, the query applies only to the subset of commands available that match the Tag field. In this case, the Data field should not be used because it is ignored by the device.

Data Field Usage

When a query is used in place of the Data field, the query applies only to the specific command identified by the Tag and SubTag fields.

Concatenation of Multiple Commands

Multiple commands can be issued within one Prefix/Storage sequence. Only the Tag, SubTag, and Data fields must be repeated for each command in the sequence. If additional commands are to be applied to the same Tag, then the new command sequence is separated with a comma (**,**) and only the SubTag and Data fields of the additional command are issued. If the additional command requires a different Tag field, the command is separated from previous commands by a semicolon (**;**).

Responses

The device responds to serial commands with one of three responses:

ACK Indicates a good command which has been processed.

ENQ Indicates an invalid Tag or SubTag command.

NAK Indicates the command was good, but the Data field entry was out of the allowable range for this Tag and SubTag combination, e.g., an entry for a minimum message length of 100 when the field will only accept 2 characters.

When responding, the device echoes back the command sequence with the status character inserted directly before each of the punctuation marks (the period, exclamation point, comma, or semicolon) in the command.

Examples of Query Commands

In the following examples, a bracketed notation [ ] depicts a non-displayable response.

Example #1:What is the range of possible values for Imaging Style?

Enter: **snpsty*.**

Response: **SNPSTY0-2[ACK]**

This response indicates that Imaging Style (SNPSTY) has a range of values from 0 to 2.

Example #2: What is the default value for Imaging Style?

Enter: **snpsty^.**

Response: **SNPSTY1[ACK]**

This response indicates that the default setting for Imaging Style (SNPSTY) is 1, or Photo.

Example #3: What is the device's current setting for Imaging Style?

Enter: **snpsty?.**

Response: **SNPSTY2[ACK]**

This response indicates that the device's Imaging Style (SNPSTY) is set to 2, or Manual.

Menu Commands

The following chart lists the settings for each of the serial default commands. The factory default setting is indicated by an asterisk (*).

Selection	Setting ** Indicates default*	Serial Command *# Indicates a numeric entry*	For full description, see page
Imaging Default Commands			
	Default all Imaging Commands	IMGDFT	1-1
Image Snap (IMGSNP)	Imaging Style - Decoding	SNPSTY0	1-1
	*Imaging Style - Photo	SNPSTY1	1-1
	Imaging Style - Manual	SNPSTY2	1-1
	Beeper On	SNPBEP1	1-1
	*Beeper Off	SNPBEP0	1-1
	Aimer Lines On	SNPAIM1	1-2
	*Aimer Lines Off	SNPAIM0	1-2
	Exposure (1-7874 microseconds)	SNPEXP	1-2
	*Gain - None	SNPGAN1	1-3
	Gain - Medium	SNPGAN2	1-3
	Gain - Heavy	SNPGAN4	1-3
	Gain - Maximum	SNPGAN8	1-3
	Delta for Acceptance (0-255) *25	SNPDEL###	1-3
	*LED State - Off	SNPLED0	1-2
	LED State - On	SNPLED1	1-2
	*Wait for Trigger Off	SNPTRG0	1-2
	Wait for Trigger On	SNPTRG1	1-2
	Update Tries (0-10) *6	SNPTRY##	1-3
	Target White Value (0-255) *125	SNPWHT###	1-3
	Target Set Point Percentage (1-99) *97	SNPPCT##	1-4
Image Ship (IMGSHP)	*Infinity Filter - Off	IMGINF0	1-6
	Infinity Filter - On	IMGINF1	1-6
	*Compensation Off	IMGCOR0	1-6
	Compensation On	IMGCOR1	1-6
	*Pixel Depth - 8 bits/pixel (grayscale)	IMGBPP8	1-6
	Pixel Depth - 1 bit/pixel (B&W)	IMGBPP1	1-6
	*Don't Sharpen Edges	IMGEDG0	1-7
	Sharpen Edges (0-23)	IMGEDG##	1-7
	*File Format - JPEG	IMGFMT6	1-7
	File Format - KIM	IMGFMT0	1-7
	File Format - TIFF binary	IMGFMT1	1-7
	File Format - TIFF binary group 4, compressed	IMGFMT2	1-7
	File Format - TIFF grayscale	IMGFMT3	1-7
	File Format - Uncompressed binary	IMGFMT4	1-7
	File Format - Uncompressed grayscale	IMGFMT5	1-7
	File Format - BMP	IMGFMT8	1-7
	*Histogram Stretch Off	IMGHIS0	1-7
	Histogram Stretch On	IMGHIS1	1-7

Selection	Setting ** Indicates default*	Serial Command *# Indicates a numeric entry*	For full description, see page
Image Ship (continued)	Invert Image around X axis	IMGNVX1	1-8
	Invert Image around Y axis	IMGNVY1	1-8
	*Noise Reduction Off	IMGFSP0	1-8
	Noise Reduction On	IMGFSP1	1-8
	*Rotate Image Off	IMGROT0	1-9
	Rotate Image 90° right	IMGROT1	1-9
	Rotate Image 180°	IMGROT2	1-9
	Rotate Image 90° left	IMGROT3	1-9
	*Adaptive Text Filter Off	IMGAUT0	1-9
	Adaptive Text Filter On	IMGAUT1	1-9
	*Unsharp/Brighten Filter Off	IMGSNZ0	1-10
	Unsharp/Brighten Filter On	IMGSNZ1	1-10
	JPEG Image Quality (0-100) *50	IMGJQF###	1-10
	*Gamma Correction Off	IMGGAM0	1-10
	Gamma Correction On (0-1,000)	IMGGAM###	1-10
	Image Crop - Left (0-1279) *0	IMGWNL###	1-11
	Image Crop - Right (0-1279) *1279	IMGWNR###	1-11
	Image Crop - Top (0-959) *0	IMGWNT###	1-11
	Image Crop - Bottom (0-959) *959	IMGWNB###	1-11
	Image Crop - Margin (0-478) *0	IMGMAR###	1-11
	Protocol - None (raw)	IMGXFR0	1-11
	Protocol - None (default USB)	IMGXFR2	1-11
	Protocol - Hmodem	IMGXFR3	1-11
	Protocol - Hmodem Compressed	IMGXFR4	1-11
	*Ship Every Pixel	IMGSUB1	1-12
	Ship Every 2nd Pixel	IMGSUB2	1-12
	Ship Every 3rd Pixel	IMGSUB3	1-12
	*Document Image Filter Off	IMGUSH0	1-12
	Document Image Filter On (0-255)	IMGUSH###	1-12
	*Blur Image Off	no serial command	1-13
	Blur Image On	no serial command	1-13
	*Don't Ship Histogram	IMGHST0	1-13
	Ship Histogram	IMGHST1	1-13
Image Auto Crop (IMGACP)	*Infinity Filter - Off	IMGINF0	1-6
	Infinity Filter - On	IMGINF1	1-6
	*Compensation Off	IMGCOR0	1-6
	Compensation On	IMGCOR1	1-6
	*Pixel Depth - 8 bits/pixel (grayscale)	IMGBPP8	1-6
	Pixel Depth - 1 bit/pixel (B&W)	IMGBPP1	1-6
	*Don't Sharpen Edges	IMGEDG0	1-7
	Sharpen Edges (0-23)	IMGEDG##	1-7
	*File Format - JPEG	IMGFMT6	1-7
	File Format - KIM	IMGFMT0	1-7
	File Format - TIFF binary	IMGFMT1	1-7
	File Format - TIFF binary group 4, compressed	IMGFMT2	1-7

Selection	Setting ** Indicates default*	Serial Command *# Indicates a numeric entry*	For full description, see page
Image Auto Crop (continued)	File Format - TIFF grayscale	IMGFMT3	1-7
	File Format - Uncompressed binary	IMGFMT4	1-7
	File Format - Uncompressed grayscale	IMGFMT5	1-7
	File Format - BMP	IMGFMT8	1-7
	*Histogram Stretch Off	IMGHIS0	1-7
	Histogram Stretch On	IMGHIS1	1-7
	Invert Image around X axis	IMGNVX1	1-8
	Invert Image around Y axis	IMGNVY1	1-8
	*Noise Reduction Off	IMGFSP0	1-8
	Noise Reduction On	IMGFSP1	1-8
	*Rotate Image Off	IMGROT0	1-9
	Rotate Image 90° right	IMGROT1	1-9
	Rotate Image 180°	IMGROT2	1-9
	Rotate Image 90° left	IMGROT3	1-9
	*Adaptive Text Filter Off	IMGAUT0	1-9
	Adaptive Text Filter On	IMGAUT1	1-9
	*Unsharp/Brighten Filter Off	IMGSNZ0	1-10
	Unsharp/Brighten Filter On	IMGSNZ1	1-10
	JPEG Image Quality (0-100) *50	IMGJQF###	1-10
	*Gamma Correction Off	IMGGAM0	1-10
	Gamma Correction On (1-255)	IMGGAM###	1-10
	Protocol - None (raw)	IMGXFR0	1-11
	Protocol - None (default USB)	IMGXFR2	1-11
	Protocol - Hmodem Compressed	IMGXFR3	1-11
	Protocol - Hmodem	IMGXFR4	1-11
	Ship Every Pixel	IMGSUB1	1-12
	Ship Every 2nd Pixel	IMGSUB2	1-12
	Ship Every 3rd Pixel	IMGSUB3	1-12
	*Document Image Filter Off	IMGUSH0	1-12
	Document Image Filter On (0-255)	IMGUSH###	1-12
	*Blur Image Off	no serial command	1-13
	Blur Image On	no serial command	1-13
	*Don't Ship Histogram	IMGHST0	1-13
	Ship Histogram	IMGHST1	1-13
Intelligent Signature Capture (IMGBOX)	Output Image Width	no serial command	1-14
	Output Image Height	no serial command	1-15
	*Pixel Depth - 8 bits/pixel (grayscale)	IMGBPP8	1-15
	Pixel Depth - 1 bit/pixel (B&W)	IMGBPP1	1-15
	*File Format - JPEG	IMGFMT6	1-15
	File Format - KIM	IMGFMT0	1-15
	File Format - TIFF binary	IMGFMT1	1-15
	File Format - TIFF binary group 4, compressed	IMGFMT2	1-15
	File Format - TIFF grayscale	IMGFMT3	1-15
	File Format - Uncompressed binary	IMGFMT4	1-15
	File Format - Uncompressed grayscale	IMGFMT5	1-15

Selection	Setting ** Indicates default*	Serial Command *# Indicates a numeric entry*	For full description, see page
Intelligent Signature Capture (continued)	File Format - BMP	IMGFMT8	1-15
	Height of Signature Capture Area	no serial command	1-15
	*Gamma Correction Off	IMGGAM0	1-15
	Gamma Correction On (1-255)	IMGGAM###	1-15
	Resolution of Signature Capture Area (0-2500)	no serial command	1-16
	Barcode Aspect Ratio	no serial command	1-16
	Width of Signature Capture Area	no serial command	1-16
	Horizontal Barcode Offset	no serial command	1-16
	Vertical Barcode Offset	no serial command	1-16

3 Customer Support

Technical Assistance

If you need assistance installing or troubleshooting, please call your Distributor or the nearest Hand Held Products technical support office:

North America/Canada

Telephone: (800) 782-4263
Fax number: (315) 554-6705
E-mail: natechsupport@handheld.com

Latin America

Telephone: (803) 835-8000
Telephone: (800) 782-4263
E-mail: latechsupport@handheld.com

Brazil

Telephone: +55 (21) 3535-9100
Fax: +55 (21) 3535-9105
E-mail: brsuporte@handheld.com

Mexico

Telephone: (803) 835-8000
E-mail: latechsupport@handheld.com

Europe, Middle East, and Africa

Telephone: +31 (0) 40 7999 393
Fax: +31 (0) 40 2425 672
E-mail: eurosupport@handheld.com

Asia Pacific

Telephone - Hong Kong: +852-3188-3485 or 2511-3050
Telephone - China: +86 21 6361 3818
E-mail: aptechsupport@handheld.com

Japan

Telephone: +813 5770-6312
E-mail: aptechsupport@handheld.com

Malaysia

Telephone: +603-6201-7020
E-mail: aptechsupport@handheld.com

Online Technical Assistance

You can also access technical assistance online at www.handheld.com.

For Further Information

To download the full User's Guide for these products, visit our website at www.handheld.com.

Product Service and Repair

Hand Held Products provides service for all its products through service centers throughout the world. To obtain warranty or non-warranty service, return the unit to Hand Held Products (postage paid) with a copy of the dated purchase record attached. Contact the appropriate location below to obtain a Return Material Authorization number (RMA #) before returning the product.

North America

Telephone: (800) 782-4263
Fax: (803) 835-8012
E-mail: naservice@handheld.com

Latin America

Telephone: (803) 835-8000
Telephone: (800) 782-4263
Fax: (239) 263-9689
E-mail: laservice@handheld.com

Brazil

Telephone: +55 (21) 3535-9100
Fax: +55 (21) 3535-9105
E-mail: brservice@handheld.com

Mexico

Telephone: +52 (55) 5203-2100
Fax: +52 (55) 5531-3672
E-mail: mxservice@handheld.com

Europe, Middle East, and Africa

Telephone: +31 (0) 40 2901 633
Fax: +31 (0) 40 2901 631
E-mail: euservice@handheld.com

Asia Pacific

Telephone: +852-2511-3050
Fax: +852-2511-3557
E-mail: apservice@handheld.com

Japan

Telephone: +813-5770-6312
Fax: +813-5770-6313
E-mail: apservice@handheld.com

Online Product Service and Repair Assistance

You can also access product service and repair assistance online at www.handheld.com.

Hand Held Products, Inc.
700 Visions Drive
P.O. Box 208
Skaneateles Falls, NY 13153-0208

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